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Section II (Remarks)**Amendment of Claims**

Claims 1, 23, 27, 44, 46, 56, 66, 71, and 76-80 have been amended herewith, and claims 73-75 have been cancelled herewith.

Claim 44 has been amended, *inter alia*, to recite that the membrane-forming material is extrusion coated.

Claims 76-80 have been amended, *inter alia*, to recite that that the fibrous core is a fibrous solid core.

Claims 1, 23, 44, 56, 66, 71, and 76 have been amended to recite that the layer(s) extrusion coated over the solid core, and the resulting tubular membrane wall, are substantially circumferentially uniform, by the following recitations of “substantially circumferentially uniform:” in steps (b), (c), and (e) of claim 1; in steps (b) and (d) of claim 23; in steps (b) and (e) of claim 44; in steps (b) and (d) of claim 56; in steps (b) and (e) of claim 66; in steps (b) and (d) of claim 71; and in steps (a) and (b) of claim 76.

Claim 77 has been amended to recite that the core comprises a substantially circumferentially extrusion coating of a removable substrate material layer.

Claims 27 and 46 have been amended to correct a minor typographical error, in that the units of the upper numerical value of the recited range should be “millimeters” rather than the originally recited “millimeter.”

All of the foregoing recitals are fully consistent with and supported by the original disclosure of the application, and no new matter within the meaning of 35 USC § 132 has been added.

Cancellation of Claims

Claims 73-75 are cancelled herein to advance prosecution of the present application, but such cancellation of claims 73-75 is with express reservation of the right to file one or more divisional patent applications directed to the subject matter of such cancelled claims, during the pendency of the present application or during the pendency of a future continuation or divisional application based on and claiming the priority of the present application.

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Rejection of Claims, and Traversal Thereof

In the November 16, 2005 Office Action, the Examiner rejected claims 1-68, 71 and 73-80 on reference grounds, including:

- a rejection of claims 1-43, 56-68, 71, and 73-80 under 35 USC 103 (a) as being unpatentable over U.S. Patent No. 6,113,722 to Hoffman, et al. (“Hoffman”) in view of U.S. Patent No. 3,853,687 to Ishikawa, et al. (“Ishikawa”); and
- a rejection of claims 44-55 under 35 USC 103(a) as being unpatentable over Hoffman, et al.

As noted previously, claims 73-75 have been cancelled. The rejections of the remaining claims 1-68, 71, and 76-80 are traversed, and reconsideration of the patentability of the pending claims is requested, in light of the foregoing amendments and the ensuing remarks.

A. Patentability of Claims 1-43, 56-68, 71, and 76-80 over Hoffman in view of Ishikawa

As noted above, claims 1, 23, 56, 66, 71, and 76 have been amended to recite that the layer(s) extrusion coated over the solid core, and the resulting tubular membrane wall, are “substantially circumferentially uniform.”

Claims 2-22 (which depend, directly or indirectly, from claim 1), claims 24-43 (which depend, directly or indirectly, from claim 23), claims 57-65 (which depend, directly or indirectly, from claim 56), claims 67-68 (which depend, directly or indirectly, from claim 66), and claims 77-80 (which depend, directly or indirectly, from claim 76) therefore likewise require that the layer(s) extrusion coated over the solid core, and the resulting tubular membrane wall, are “substantially circumferentially uniform.”

The examiner has conceded (at page 2 of the November 16, 2005 Office Action) that Hoffman “fail[s] to show the aspect of employing a coextrusion or extrusion coating [of] a removable core or membrane material to form a hollow fiber.” The examiner proceeded to state, however, that “Ishikawa et al does this and such would have been an obvious coating process in lieu of the other methods generally taught in Hoffman et al dependent on the exact material used [as] the core/removable substrate material.” Applicants respectfully disagree with this conclusion.

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First, Ishikawa fails to teach or suggest any extrusion over a solid core, as required by independent claims 1, 23, 56, 66, 71, and 76 and the claims depending therefrom. Instead, Ishikawa – which is directed to the formation of improved synthetic fibers for fabric and clothing – teaches the simultaneous extrusion of two different types of spinning materials through a turbulence-providing zone (e.g., a bed of sand particles 5) to provide sheath-core type conjugate modified conjugate fibers each having complexedly shaped and arranged undulations on and along the conjugating surface between the two different spinnate materials. See, e.g., Ishikawa, col. 3, line 58 – col. 4, line 5. Thereafter, the conjugate fibers are treated with solvent to dissolvingly remove the sheath or the core component having affinity with the solvent. Id., col. 4, lines 5-10. It is clear that the extrusion of two materials taught by Ishikawa cannot involve extrusion coating over a “solid core,” since both materials of Ishikawa must travel (i.e., as liquids) through a bed of solid (sand) particles 5 to exit the spinneret. See Ishikawa Fig. 1.

Second, Ishikawa fails to teach or suggest formation by extrusion of any “substantially circumferentially uniform” layer as required by independent claims 1, 23, 56, 66, 71, and 76 and the claims depending therefrom. To the contrary, Ishikawa is specifically discloses and claims the formation of an interface between a core and sheath that is:

“characterized by extruded extreme irregular undulations which vary in cross-section along the entire length of the fiber ... leaving a hollow sheath with said extreme irregular undulations on the internal surface thereof.”

See, e.g., Ishikawa, col. 8, lines 45-52 (claim 1); col. 6, lines 5-12 & Figs. 3-5. The extremely irregular character of the Ishikawa fibers is specifically intended to provide increased overall surface area for improving the heat preserving capability over conventional synthetic fibers, to provide high tensile strength, and to provide improved tactile sensation by avoiding the ‘defective waxy feeling’ of conventional synthetic fibers. See Ishikawa, col. 1, line 30-col. 2, line 24. The “extreme irregular undulations which vary in cross-section” are exactly opposite to the “substantially circumferentially uniform” layers formed by extrusion over a solid core and resulting in a substantially circumferentially uniform tubular membrane wall that is the subject of claims.”

The substantial circumferential uniformity of the extruded layer(s) and resulting substantially circumferentially uniform tubular membrane wall is directly facilitated by the use of a solid core and an extrusion process to coat the same. Cross-sectional views of the resulting polymeric hollow fibers having substantially circumferentially uniform tubular membrane wall are shown in Figs. 4-8 of the present application.

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The examiner has combined Hoffman and Ishikawa in support of the present rejection. According to MPEP 2142:

To establish a *prima facie* case of obviousness, *three* basic criteria *must* be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In addition, a basic consideration, which applies to all obviousness rejections, is that references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination. MPEP § 2141.02.

The proposed combination of Hoffman and Ishikawa fails all three requirements that must be satisfied to demonstrate a *prima facie* case of obviousness.

Hoffman et al. variously teaches coating involving the use of chemical vapor deposition, sputtering, magnetron sputtering, electrophoresis, plasma-enhanced deposition, electroplating, electroless deposition, spraying, dipping, coacervation, fluidized bed coating, photolithography, laser deposition, plasma spray, polymeric polymerization, physical vapor deposition, sol gel, and plasma assisted physical vapor deposition. Hoffman et al. further discloses a preference for "magnetron sputtering" (column 2, line 22) and "electrodeposition which is a much faster and less expensive deposition technique" (column 5, lines 31-32).

With the recitation of a panoply of suitable techniques, and identification of two particularly preferred techniques, there is simply no basis for any conclusion or suspicion that the techniques enumerated by Hoffman et al. are unable to facilitate coating of a substrate, or that they are in any way defective or unsatisfactory¹.

¹ To the contrary, Hoffman's specific reference to the speed and favorable cost of electrodeposition and Hoffman et al.'s clearly expressed preference for magnetron sputtering and electrodeposition are indicative of the suitability of techniques disclosed in Hoffman et al.

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Accordingly, there is no motivation derived from Hoffman et al., that would impel one of ordinary skill in the art to arbitrarily discard chemical vapor deposition, sputtering, magnetron sputtering, electrophoresis, plasma-enhanced deposition, electroplating, electroless deposition, spraying, dipping, coacervation, fluidized bed coating, photolithography, laser deposition, plasma spray, polymeric polymerization, physical vapor deposition, sol gel, and plasma assisted physical vapor deposition, and to instead substitute extrusion. Extrusion is a fundamentally different and non-analogous unit operation in relation to the techniques disclosed in Hoffman et al. – in such respect, extrusion requires different equipment, different operating conditions, different operator skills, different equipment maintenance, different quality assurance procedures, a different footprint in the manufacturing facility, etc.

One reading Hoffman et al. therefore would be led in the direction of the utilizing the proven techniques of such reference, and avoiding fundamentally different and non-analogous techniques.

Accordingly, the *prima facie* case fails at the outset, since the first criterion is not met.

The second criterion for a *prima facie* case – reasonable basis for success – is similarly lacking here. Present claims 1, 23, 56, 66, 71, and 76 require the step of extrusion coating of a substantially circumferentially uniform layer of a polymeric membrane-forming material over a solid core, to ultimately yield a polymeric hollow fiber comprising a substantially circumferentially uniform tubular membrane wall enclosing an elongated lumen therein. Hoffman teaches the formation of regular (substantially uniform) hollow fibers over removable solid rod supports using satisfactory techniques not including extrusion. Ishikawa, in contrast, teaches away from the use of solid rod supports (since such solid rods would be incompatible with the extrusion technique used by Ishikawa); instead, Ishikawa teaches simultaneous extrusion of two liquids to form an extremely irregular hollow product. There is simply no reasonable basis for successfully combining Hoffman with Ishikawa to yield the subject matter of claims 1, 23, 56, 66, 71, and 76 and the claims depending therefrom.

The third criterion for a *prima facie* case – teaching or suggestion of all of the claim limitations – has already been demonstrated to be lacking. Hoffman fails to teach extrusion. Ishikawa fails to teach the use of extrusion coating of any layer over a solid rod. Neither teach extrusion to form a polymeric hollow fiber comprising a substantially circumferentially uniform tubular membrane wall.

It is well established that “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v.*

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Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).” (emphasis in original; MPEP 2141.02). It has already been demonstrated Ishikawa clearly teaches away from the formation of any substantially circumferentially uniform tubular membrane wall.

Since no *prima facie* case of obviousness is established by Hoffman and Ishikawa, the obviousness rejection cannot stand.

For the foregoing reasons, claims 1-43, 56-68, 71, and 76-80 are fully patentably distinguished over the art, and in condition for allowance. Favorable action is therefore requested.

B. Patentability of Claims 44-55 over Hoffman

As noted above, claim 44 has been amended to recite that the membrane-forming material is extrusion coated, and that the layer of swellable polymeric membrane-forming material extrusion coated over the solid core, and the resulting tubular membrane wall, are “substantially circumferentially uniform.” Claims 45-55 depend, whether directly or indirectly, from claim 44, and therefore include the same limitations.

The examiner has conceded that Hoffman does not teach extrusion. For at least the reason that Hoffman fails to teach all of the limitations of the claims, Hoffman alone cannot support a *prima facie* case of obviousness of claims 44-55 pursuant to MPEP § 2143.03, and the obviousness rejection of these claims cannot stand.

Any attempted combination of Hoffman and Ishikawa to remedy the deficiency of Hoffman in that regard would fail to support a *prima facie* case of obviousness of claims 44-55 for the same reasons stated hereinabove.

Additionally, neither Hoffman nor Ishikawa teach or suggest the use of swellable materials as required by claims 44-55. To the extent that the examiner persists in claiming that such usage is “well within the skill of the art” as a conventional method for removing a membrane from a solid rod, the examiner is hereby requested to provide the specific evidentiary basis for such a claim pursuant to MPEP 2144.03. As noted by the court in *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970), the notice of facts beyond the record which may be taken by the examiner must be “capable of such instant and

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unquestionable demonstration as to defy dispute" (citing *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961)).

Hoffman et al. contrarily teaches to use a hollow polymeric fiber that under his solvation conditions expands inwardly to decrease the hoop stress (see column 11, lines 2-7 of Hoffman et al.: "the hollow core allows room for expansion of the fiber during solvation...[s]ince polymers swell during solvation, the hollow core allows expansion inward, which decreases hoop stress on the wall material and allows for fabrication of thin-walled tubes using polymer fibers.").

If therefore is apparent that Hoffman et al. teaches processing of a polymer to swell inwardly for relief of stress, whereas applicants require use of "a swelling agent to effectuate expansion and disengagement of such polymeric membrane from the solid core fiber," opposite to the approach of Hoffman et al. The approach of Hoffman, if applied to a solid core fiber as required by applicants' claimed invention, would result in the compressive bearing of the polymeric membrane on the solid core fiber, not "expansion and disengagement" of the polymeric membrane from the solid core fiber, as recited in applicants' independent claim 44.

For the foregoing reasons, claims 44-55 are fully patentably distinguished over the art, and in condition for allowance. Favorable action is therefore requested.

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CONCLUSION

Claims 1-68, 71 and 76-80 have been shown herein to be patently distinguished over Hoffman and Ishikawa, and such claims are now in condition for allowance.

If any additional issues remain, incident to the formal allowance of the application, the examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss their resolution, in order that this application may be passed to issue at an early date.

Respectfully submitted,



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Authorization is hereby given for charging of any fee or amount properly payable in connection with the filing of this Amendment, to Deposit Account No. 08-3284.

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